



# Fitting within 25, 50, 75, 100

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10/23/97

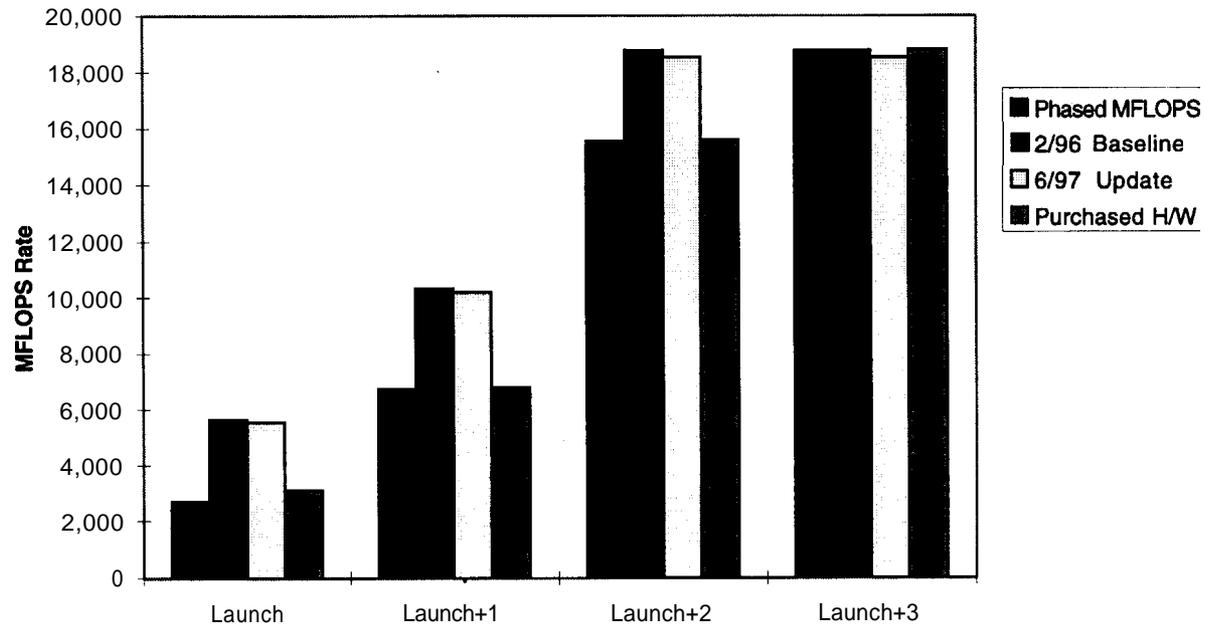


25, 50, 75, 100%



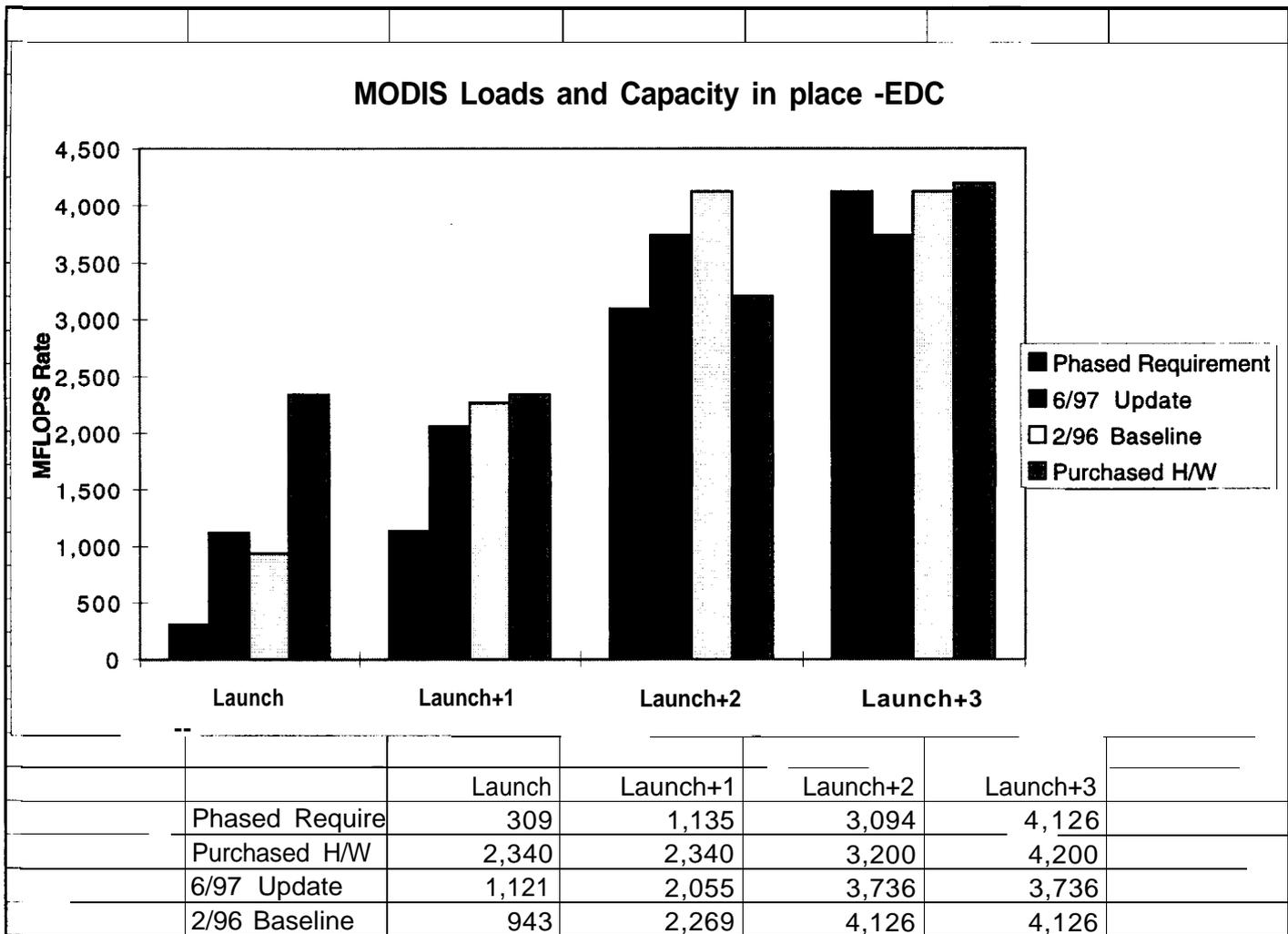
- Processing ramp up was recommended by ERG to reduce costs of EOSDIS without serious impact to EOS science
- Ramp up is:
  - L : (Level 1 + 25% of L2 to L4) \* 1.2x
  - L+12: (Level 1 + 50% of L2 to L4) \* 2.2
  - L+24: (Level 1 + 75% of L2 to L4) \* 4
  - L+36: (Level 1 + 100% of L2 to L4) \* 4
- More resources at the DAACs than required to satisfy the above phased processing requirements provided MODIS software performance in the ECS system is better than our 6/97 baseline

**MODIS Loads and Capacity in place-GSFC**

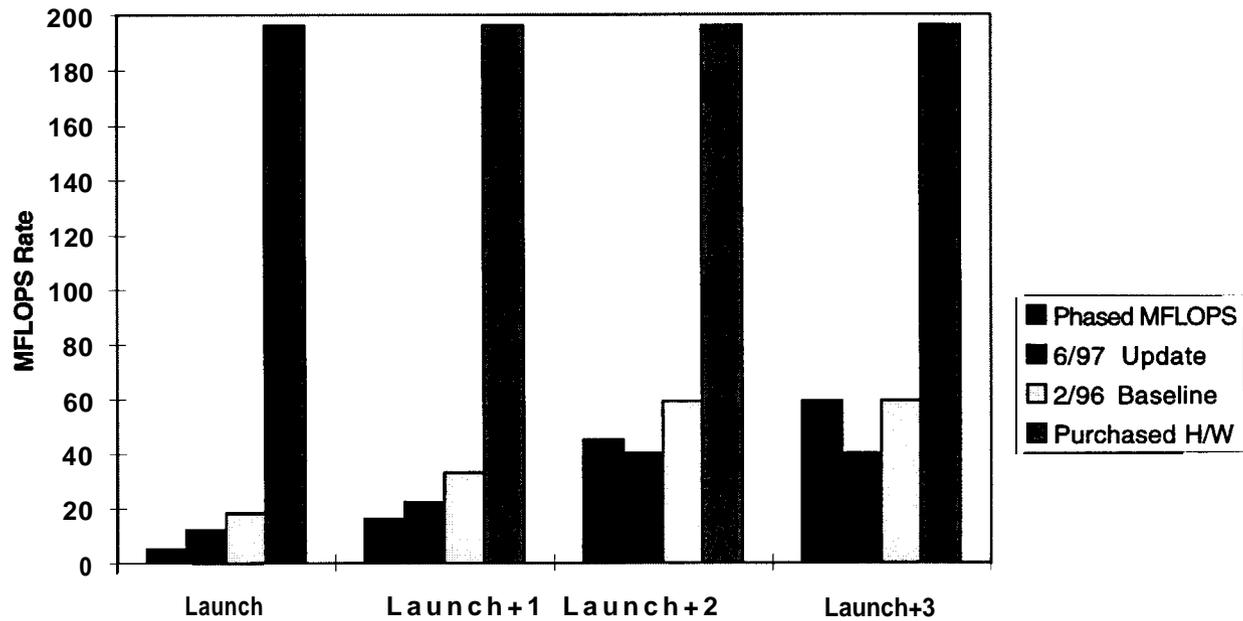


GSFC					
	Launch	Launch+1	Launch+2	Launch+3	
Phased MFLOPS	2,703	6,743	15,512	18,762	
2/96 Baseline	5,629	10,319	18,762	18,762	
6/97 Update	5,555	10,184	18,516	18,516	
Purchased H/W	3,120	6,800	15,600	18,800	
Level 1	100%	100%	100%	100%	
Levels 2, 3	25%	50%	75%	100%	
Multiplier	1.2	2.2	4	4	

EDC DAAC Chart



**MODIS Loads and DAAC Capacity in Place - NSIDC**



		NSIDC			
		Launch	Launch+1	Launch+2	Launch+3
	Phased MFLOPS	5	16	45	59
	6/97 Update	12	22	40	40
	2/96 Baseline	18	33	59	59
	Purchased H/W	196	196	196	196

# Post-Launch Ramp Up

- All of Level 1 and Cloud Mask
- Oceans - All products
  - Global 5km rather than 1km
  - CoastalUS and validation sites 1km
- Atmosphere - All products
  - 5km except for products Land needs at 1km
- Land - All products
  - Full resolution, regional production
    - North America, South America, portion of Africa...
  - Global, full resolution, 1 month



# At GSFC DAAC



- 3,120 MFLOPS
  - 20% for SSI&T and downtime 624 MFLOPS
  - All of Level 1 products 543 MFLOPS
  - Cloud Mask and Atmos. Prof. 446 MFLOPS
  - Sub-total 1,613 MFLOPS
- 1,507 MFLOPS remain for higher level products
- Based on 6/97 baseline higher level processing at GSFC could be divided as follows:
  - Land 609 MFLOPS
  - Oceans 701 MFLOPS
  - Atmosphere (w/o Cloud Mask) 197 MFLOPS



# EDC and NSIDC



- Sufficient processing exists at other DAACs to make the MODIS product sets at full resolution and globally provided enough products arrive from GSFC
- MODIS requirement at EDC is 1,121 MFLOPS and 2,340 MFLOPS exists now. Aster has a 165MFLOP requirement which is included in the 2,340 MFLOPS.
- MODIS requirement at NSIDC is currently 18MFLOPS and 196 MFLOPS are available there



# Questions for Consideration



- Does the strawman allocation of processing resources at the GDAAC work for your discipline?
- If not, how would you propose the processing resources at GSFC DAAC be divided up at-launch?
- Have you coordinated your processing plans with the other disciplines when there are higher level products involved?
- How well do the plans for post-launch processing mesh between disciplines? (Discuss after summary presentations from the disciplines)

# Volumes and Loads for MODIS Processing in Version 2

## MODIS Process Load Summary L1 and Atmosphere

Process ID	Process Name	Millions of Floating Point Ops per Execution	No. of Exec. /day	<b>MFLOPS</b>
MOD01 :L1A	MODIS Level 1 A Production from Level 0	453,960	12.00	63.1
MOD02:L1B	MODIS Level 1 B Production of Calibrated Radiances	86,678	288.00	288.9
MOD03:L1A	MODIS Level 1A Production of Geolocation Fields	54,990	288.00	183.3
MOD04/05:L2	MODIS Level 2 Production of Aerosol and Column Water Vapor Product	38,249	288.00	127.5
MOD04L:ORBIT	MODIS Level 3 18km Gridded Land Aerosol Product on Single Orbit	18,525	14.60	3.1
MOD06:L2	MODIS L2 Production of Cloud Product	87,341	288.00	291.1
MOD07:L2	MODIS L2 Production of Atmospheric Profiles, Ozone, and Stability Indices	20,719	288.00	69.1
MOD08:L3:D	MODIS Level 3 Daily Joint Aerosol, Cloud, and NIR Water Vapor Product	8,640,000	1.00	100.0
MOD08:L3:M	MODIS Level 3 Monthly Joint Aerosol, Cloud, and NIR Water Vapor Product	8,640,000	0.03	3.3
MOD35:L2	MODIS Level 2 Production of Cloud and Surface Classification Masks	111,540	288.00	371.8
MOD35:COMP:D	MODIS Daily Clear-Sky Radiance File Compositing Process for MOD35	432,744	1.00	5.0
			Sum: L1	535
			Sum: Atmos	966

MODLAND VOLUMES AND LOADS 10/15/97						
(R.W. & L.F.)						
	PGE	Name	Process	Load MFLOPS	Archive Vol	Notes
	12	L2G Geoangle	FRMGR	53	19	
	12	L2G Pointers	FRMGPNTR	448	12	transmit =226
	22	L3 Aggregation	PRAGG	265	15	interim
	11	L2 Reflectance/Fire	PR09	104	77	interim
	13	L2G Reflectance	FRMGR	168	104	
	21	L3 Gridded Reflectance	PR09A	184	9	
	07	L2 Snow	PR10	6	2	
	14	L2G Snow	FRMGR	45	9	interim
	43	L3 Snow Daily	PR10A1	22	4	
	45	L3 Snow 8 Day	PR10A2	4	1	
	46	CMG Snow Daily	PR10C1	5	nil	
	67	CMG Snow 8 Day	PR10C2	1	nil	
	16	L2/L3 LST Daily	PR11	31	7	
	31	L3 LST 8 Day	PR11A2	9	1	
	32	CMG LST Daily	PR11C1	13	nil	
	58	CMG LST 8 Day	PR11C2	2	nil	
	59	CMG LST Monthly	PR11C3	1	nil	
	40	L3 Land Cover Monthly	PR12M	16	4	
	41	L3 Land Cover Quarterly	PR12Q	1	1	
	42	CMG Land Cover Quarterly	PR12C	1	nil	
	25	L3 VI 16 Day (250m)	PR13A1	230	5	
	##	L3 VI 16 Day (1km)	PR13A2	69	2	
	26	L3 VI Monthly (1km)	PR13A3	93	1	
	27	CMG VI 16 Day (1km)	PR13C2	5	nil	
	28	CMG VI Monthly	PR13C3	2	nil	
	13	L2G Fire	FRMGR	83	12	
	29	L3 Fire 8 Day	PR14A	83	6	
	30	L3 Fire Monthly	PR14A3	35	2	
	33	L4 LAI/FPAR Daily	PR15A2	69	4	?interim
	34	L4 LAI/FPAR 8 Day	PR15	35	1	
	35	CMG LAI/FPAR 8 Day	PR15C	9	nil	
	63	CMG LAI/FPAR Monthly	PR15C	2	nil	
	36	L4 NPP Daily	PR17A1	69	4	?interim
	37	L4 NPP 8 Day	PR17A2	35	1	
	38	L4 NPP Year	PR17	1	nil	
	39	L4 CMG NPP 8 Day	PR17C	9	nil	
	64	CMG NPP Year	PR17C	1	nil	
	08	L2 Sea Ice	PR29	11	2	
	15	L2G Ice	FRMGR	41	6	interim
	44	L3 Sea Ice Daily	PR29A1	32	1	
	47	L3 Sea Ice 8 Day	PR29A2	3	nil	
	48	CMG Sea Ice Daily	PR29C1	2	nil	
	68	CMG Sea Ice 8 Day	PR29C2	1	nil	
	23	L3 BRDF/BARS	PR43	345	3	
	24	CMG BRDF 16 Day	PR43C	5	nil	
	65	CMG BRDF Monthly	PR43C	2	nil	
	66	L4 250m Land Cover Change	PR44A	184	4	
		sum of "nil"s			2	
			Total	2833	206	
			GSFC	988	0	
			EDC	1774	196	
			NSIDC	70	10	

MODIS Process Load Summary  
Oceans

0.815	= Masuoka factor	Note: non MSBIN processes execute once per each of 40 params					
98	= sgi_expected MFLOPS						
86400	= sec/day						
ESDTs	Process ID	cpu time = user + sys time (set)	Millions of Floating Point Ops per V2 Execution	No. of Exec. /day	MFLOPS (6/97)	Assumptions & Notes:	
MODOC( L2, IL2A, L2B, QC)	MODOCCLR:L2	3 6 0 0	286,065	144.000	4 7 7	developer says 1 hr for 30% land, 50% cloud	
MOD28( L2, QC)	MOD28:L2	200	15,893	288.000	53	SDST V1 run 6/19/97 -> 177sec cpu for L	
MODOCB01 ..36	MSBIN (space binner) 36 L3 tmp ocean color granules	2640	209,781	144.000	350	SSTG run V1 code, 6/20 for L1B.D199621	
MOD28BD1..N 2	MSBIN (space binner) L3 tmp sst granules	125	9,933	288.000	33	SSTG run V1 code, 6/20 for L1B.D199621	

MODIS Process Load Summary  
Oceans

ESDTs	Process ID	cpu time = user + sys time (set)	Millions of Floating Point Ops per V2 Execution	No. of Exec. /day	MFLOPS (6/97)	Assumptions & Notes:
MODOCA01 ..36, MOD28AD1..N 2	MTBIN (time binner) L3 tmp daily	10800	858,195	40.000	397	SSTG w.a.guess; full day of 144/288 L1B in
MODOCE01 ..36, MOD28ED1..N 2	MTBIN (time binner) L3 tmp weekly	7200	572,130	5.000	33	SDST run with 7days input, 2hrs10min wait
MODOCR01 ..36, MOD28RD1..N 2	MTBIN (time binner): L3 tmp 3wk weekly	7200	572,130	5.000	33	SDST guess based on above time
MODOCR01 ..36, MOD28RD1..N 2	MFILL (gap filler): tmp 3wk weekly filled	3240	267,459	5 : 0 0 0	15	Runtime provided by Sue Walsh on 6/26
MODOCD01 ..36, MOD28DD1..N 2	M-CLOUD (ref comparer): L3 QC'ed daily	2316	184,035	40.000	85	SSTG V1 run using converter seawifs day &
MODOCW01 ..36, MOD28WD1..N A	MTBIN (time binner): L3 QC'ed weekly	7200	572,130	5.000	33	SDST run with 7days input, 2hrs10min wait

MODIS Process Load Summary  
Oceans

ESDTs	Process ID	cpu time = user + sys time (sec)	Millions of Floating Point Ops per V2 Execution	No. of Exec. /day	MFLOPS (6/97)	Assumptions & Notes:	
MOD27W	MOD27:L3:YR	3600	286,065	0.125	0	SDST est 6/23/97: ran over 2hrs completing	
MOD27Y	MOD27:L3:WK	3600	286,065	0.125	0	SDST guess based on above time	

MODIS Process Load Summary  
Oceans

ESDTs	Process ID	cpu time = user + sys time (set)	Millions of Floating Point Ops per V2 Execution	No. of Exec. /day	MFLOPS (6/97)	Assumptions & Notes:	
	BUOYMDB:L2			288.000			
				<b>SUM</b>	1510		



# V2 File Specs Baselined



- L1B (MOD02) - problems found between sim & actual output - file specs being re-worked
- L1A (MOD01)
- Geolocation (MOD03)
- CloudMask (MOD35)
- Surface Reflectance (MOD09)
- Sea Aerosol (MOD04)
- Precipitable water (MOD05)
- Profiles (MOD07)



# V2 Code Received



Official V2.0 Delivery to	CM	SSTG
— MOD_PRMGPNTR	June	10/6**
— MOD_PR10	8/28	9/15 (11days)
— MOD_PR09 (**3rd deliv)	9/17	9/23 (3 days)
— MOD_PR44A (*8/22)	9/19	9/23 (2 days)
— MOD_PR02	9/30	10/3 (3 days)
— MOD_PR29	10/8	10/9 (1 day)
— MOD_PR11A	10/15	10/16 (1 day)

\* MOD\_PR44A - re-delivered to CM

\*\*MOD\_PR09 - status changed from “data only” to “ Official” - so needed re-delivery

\*\*MOD\_PRMGPNTR - Status changed from “data only” to “official” with NO re-delivery from STM - now awaiting code fixes from STM



# V2 Code Acceptance Status



- SSTG Code Acceptance (after received by SSTG)=  
Compile Code, Standards Checks, Memory Leak Checks, PCF Checks, MCF Checks, Prologue Checks, File Spec Conformance, Correct Problems Found, Code Walkthrough

**ESTIMATED** 16.5 Days (~ 3 weeks)

## **ACTUALS:**

24 days (~ 5 weeks)

6 days (~1 week)

18 days (~ 3.5 weeks)

10 days (~ 2 weeks)

20 days (~ 4 weeks)

15 days (~ 3 weeks)

4 days (<1 week)

## **Where?**

Completed

up to walkthrough

almost to walkthrough

awaiting STM fix

awaiting STM fix

awaiting STM fix

checking/correcting

## **Comment**

2 weeks over!

GREAT!

Close

Marginal

Bad!

Bad!

Looks good



# Specific Mod Status



- MOD\_PR10 - 24 work days ~ 5 weeks (Complete)
- MOD\_PR09 - 18 work days ~ 3.5 weeks (correcting for walkthrough)
- MOD\_PR44A - 20 work days ~ 4 weeks (awaiting fix from STM)
- MOD\_PRMGPNTR - 10 work days ~ 2 weeks (awaiting fix from STM)
- MOD\_PR02 - 15 work days ~ 3 weeks (working out discrepancies between actual output and simulated data)
- MOD\_PR29 - 6 work days ~ 1 week (ready for walkthrough)
- MOD\_PR11A - 4 days < 1 week (iterating w/STM for fixes)



# V2 Code History - MOD\_PR10



- Second delivery to CM on 8/28, and to SSTG on 9/15. A couple of iterations between SSTG and STM for spec/code errors
- 9/16: asked STM to fix metadata errors;
- 9/19: STM delivered several new modules;
- 9/22: reported 9 discrepancies between spec and output code to STM and asked for fixes;
- 9/25: STM agreed to fix 7 of 9 discrepancies and ask SSTG to fix the others;
- 10/8: new code delivery. Fixed several trivial defects.
- 10/9: updated README, PACKINGLIST, makefile, pcf etc ready for code review (walkthrough). The code passed prolog and prohibited functions checks, and no memory leaks founded, but not the standard check.
- 10/17 Passed walkthrough with corrections



# V2 Code History - MOD\_PR09



- Third and official delivery to CM on 9/17 and to SSTG on 9/23.
- 9-24 Pickup by SSTG from VOB
- 9-25 Compilation
  - Notification of STM of prologue deficiencies
  - Notification of STM of prohibited functions
  - Notification of STM of small differences in one output file
- 9-26 Begin attempt at memory leak checking; not successful in getting it to run.
- 10-1 found memory leaks, but STM thought CVD has bugs in memory checking.
- 10/6 fixing prolog errors and prohibited functions
- 10/17 The code is almost ready for walkthrough except prologs.



## V2 Code History -MOD\_PR44A



- First delivery to CM on 8/22 and 9/19, and CM accepted code on 9/23 and passed it to SSTG.
- 9/29 Started code transfer process and compiled the code
- 9/30 Reported to STM that code could not run because of missing some input files. Asked STM to deliver the missing files, and asked for differences between production rules and PCF file.
- 10/2 Received modified MOD44A.c, PCFs, and production rules. With new code, compilation failed. STM is investigating.
- 10/7 Compiled ok, but core dump. STM is investigating.
- 10/20 STM is still debugging the code.



# V2 Code History - MOD\_PRMGPNTR



- First delivery to CM and to SSTG in June. SSTG checked and reviewed the code and sent STM recommendations for further developments.
- 7/31 - per the V2.0/V2.1 delivery schedule published by MODLAND, expected a second PNTR delivery on 8/15
- 8/22 - Informed that the second PNTR delivery would be around 8/31(same as PRMGR)
- 10/6 - Informed that the June code should be used as the official V2.0. Rechecked prolog and prohibited functions on first delivery.
  - Found 114 incorrect prologs vs 2 correct prologs.
  - Found many prohibited functions, like scanf, fopen, fclose, print out to stderr, etc. Reported defects to STM.
- 10/7 STM planned to redeliver PNTR code on 10/10.
- 10/20 Have not received the code.



# V2 Code History - MOD\_PR02



- 9/30 MCST delivered code to CM
- 10/3 CM accepted the code and passed it to SSTG.
- 10/6 Fixed prolog and prohibited functions. Fixing memory problems.
- 10/8 Got incomplete specs. MCST will resend specs.
- 10/14 Reported to MCST on discrepancies between L1B code and simulated data, and proposed a meeting to display and solve the discrepancies.
- 10/17 MCST proposed a resolution, based on MCST review with developer and Sim Data , to work on the differences.
- 10/18 SSTG responded MCST's proposal and pointed out not all discrepancies were addressed - awaiting resolution.



# V2 Code History - MOD\_PR29 & MOD\_PR11A



## MOD\_PR29

- First delivery to CM on 10/8 and to SSTG on 10/9
- 10/9 Code works fine except some metadata and swath name errors.
- 10/16 Fixed metadata and swath name errors, updated filespec, and reported the changes to STM and got approval.
- 10/17 Code ready for walkthrough
- MOD\_PR11A
- First delivery to CM on 10/15 and to SSTG on 10/16
- 10/22 Working w/STM to fix problems found